

**Notice of Allowability**

Application No.

10/672,524

Examiner

Juan A. Torres

Applicant(s)

NGUYEN ET AL.

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**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Amendment - After Non-Final Rejection filed on 07/03/2007.
2. ☒ The allowed claim(s) is/are 1-21.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some\* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |  |   |
|--|---|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892)   | 5. <input type="checkbox"/> Notice of Informal Patent Application                     |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 6. <input type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date _____ |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),<br>Paper No./Mail Date _____    | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment                   |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance  |
|  | 9. <input type="checkbox"/> Other _____   |

## **DETAILED ACTION**

### ***Drawings***

The modifications to the specification were received on 07/03/2007. These modifications are accepted by the Examiner.

In view of the amendment filed on 07/03/2007, the Examiner withdraws the drawing objections of the previous Office action.

### ***Specification***

The modifications to the specification were received on 07/03/2007. These modifications are accepted by the Examiner.

In view of the amendment filed on 07/03/2007, the Examiner withdraws the specification objections of the previous Office action.

### ***Claim Objections***

The modifications to the claims were received on 07/03/2007. These modifications are accepted by the Examiner.

In view of the amendment filed on 07/03/2007, the Examiner withdraws the claim objections to claims 1-21 of the previous Office action.

## **EXAMINER'S AMENDMENT**

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Allan Y. Lee on 7/5/2007.

The application has been amended as follows:

- a) In line 8 of claim 2 the recitation "factor vector;" is changed to "factor vector; and"
- b) In line 8 of claim 3 the recitation "bin to 1;" is changed to "bin to 1; and"
- c) In line 3 of claim 5 the recitation "power vector;" is changed to "power vector; and"
- d) In line 4 of claim 7 the recitation "values step (b) of Claim 1;" is changed to "values; and"
- e) In line 8 of claim 8 the recitation "power vector;" is changed to "power vector; and"
- f) In line 4 of claim 9 the recitation "flag vector;" is changed to "flag vector; and"
- g) In line 4 of claim 10 the recitation "threshold;" is changed to "threshold; and"
- h) In line 7 of claim 11 the recitation "proceeding to step (4) of claim 10, else" is changed to "proceeding to step (4)"
- i) In line 11 of claim 11 the recitation "flag vector;" is changed to "flag vector; and"
- j) In line 12 of claim 11 the recitation "proceeding with the method of Claim 1" is changed to "proceeding with the method"
- k) In line 2 of claim 12 the recitation "if said average" is changed to "when said average"

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l) In line 3 of claim 13 the recitation “output vector;” is changed to “output vector; and”

m) In line 4 of claim 15 the recitation “output vector;” is changed to “output vector; and”

n) In line 5 of claim 16 the recitation “power vector;” is changed to “power vector; and”

o) In line 5 of claim 17 the recitation “factor vector;” is changed to “factor vector; and”

p) In line 4 of claim 18 the recitation “flag;” is changed to “flag; and”

q) In line 5 of claim 19 the recitation “percentage;” is changed to “percentage; and”

***Allowable Subject Matter***

Claims 1-21 are allowed.

The following is an examiner’s statement of reasons for allowance: claims 1-21 are allowed because the references cited fail to teach, as applicant has, a method for excising narrowband interference, the method comprising the steps of a)transforming time domain data into a frequency domain vector having a plurality of frequency bins, b)estimating a plurality of power values corresponding to frequency bins of said frequency domain vector to obtain a current power vector, c)calculating an average power vector from said current power vector and at least one selected previous power vector, d)excising selected frequency bins of said frequency domain vector to produce an excised frequency domain vector, e)determining whether to include said average

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power vector in future average power vector determinations; a narrowband interference excision device, comprising a) a transformer capable of transforming time domain data to a frequency domain vector comprising a plurality of frequency bins, b) a power estimator, operatively coupled to said transformer, capable of receiving said frequency domain vector, and adapted to determine a PXW power vector comprising a plurality of power values that correspond to said plurality of frequency bins, c) a moving average calculator, operatively coupled to said power estimator, capable of receiving said PXW power vector and a discard flag, and adapted to determine an average power vector, d) an excisor, operatively coupled to said transformer, capable of receiving said frequency domain vector and said average power vector, and adapted to excise selected frequency bins of said plurality of frequency bins and determine an excised power vector and an excision flag vector, e) a transient eliminator, operatively coupled to said excisor and said moving average calculator, capable of receiving said excision flag vector, and adapted to determine whether to include said average power vector from future average power vector determinations and determine said discard flag; and an Extremely Low Frequency (ELF) receiver, comprising a) an antenna, b) a pre-amplifier, c) an analog-to-digital converter, d) a narrowband interference excision device, comprising i) a transformer capable of transforming time domain data to a frequency domain vector comprising a plurality of frequency bins, ii) a power estimator, operatively coupled to said transformer, capable of receiving said frequency domain vector, and adapted to determine a PXW power vector comprising a plurality of power values that correspond to said plurality of frequency bins, iii) a moving average

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calculator, operatively coupled to said power estimator, capable of receiving said PXW power vector and a discard flag, and adapted to determine an average power vector, iv) an excisor, operatively coupled to said transformer, capable of receiving said frequency domain vector and said average power vector, and adapted to excise selected frequency bins of said plurality of frequency bins and determine an excised power vector and an excision flag vector, and v) a transient eliminator, operatively coupled to said excisor and said moving average calculator, capable of receiving said excision flag vector, and adapted to determine whether to include said average power vector from future average power vector determinations and determine said discard flag, and at least one receiver processing device, as the applicant has claimed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Juan A. Torres whose telephone number is 571-272-3119. The examiner can normally be reached on 8-6 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 571-272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Juan Alberto Torres  
07-05-2007

  
**MOHAMMED GHAYOUR**  
**SUPERVISORY PATENT EXAMINER**